Fig. 1 Transmitter

Fig. 2 Receiver

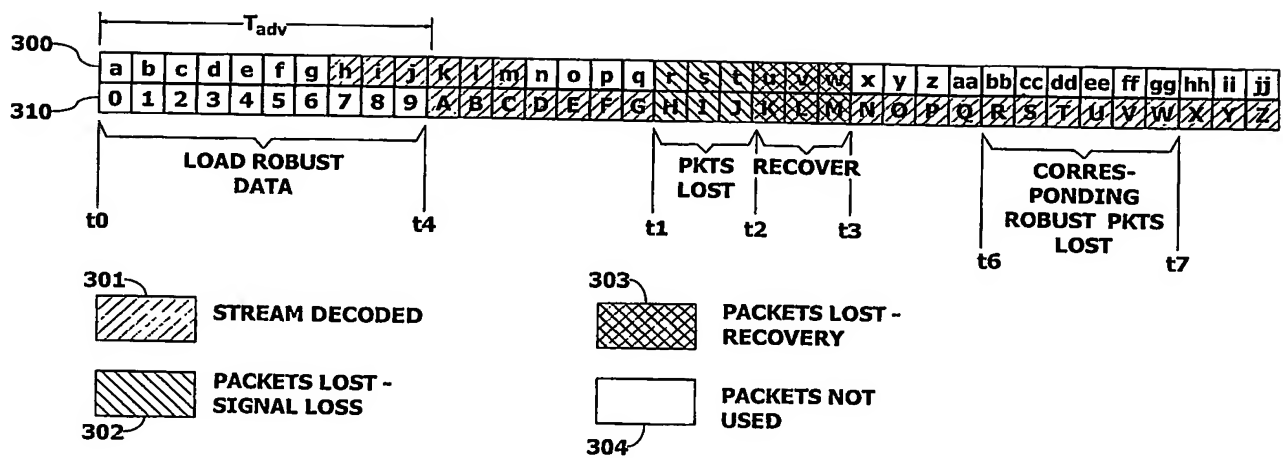Fig. 3 Packet Streams

| a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p |

450

| IDT | B | B | P | SI | B | SP | B | . . . |

440

$$T_{adv}$$

400 — | IDS N | IDS N+1 | IDS N+2 |

410 — | IDS N-1 | IDS N | IDS N+1 |

LOAD
ROBUST
DATA

t0   t4

420 GOP:

| I | B | B | P | B | B | P | B | B | P | B | B | P | B | B |

430

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |

Fig. 4 GOP Streams

a)

ROBUST
MODE
VIDEO

230"

234

232

RESULTING
VIDEO
SIGNAL

NORMAL
MODE
VIDEO

231

CNTRL

E

b)

230"

DECODED
VIDEO

236

QUALITY
FILTER

SEL

RESULTING
VIDEO
SIGNAL

238

CNTRL

231

E
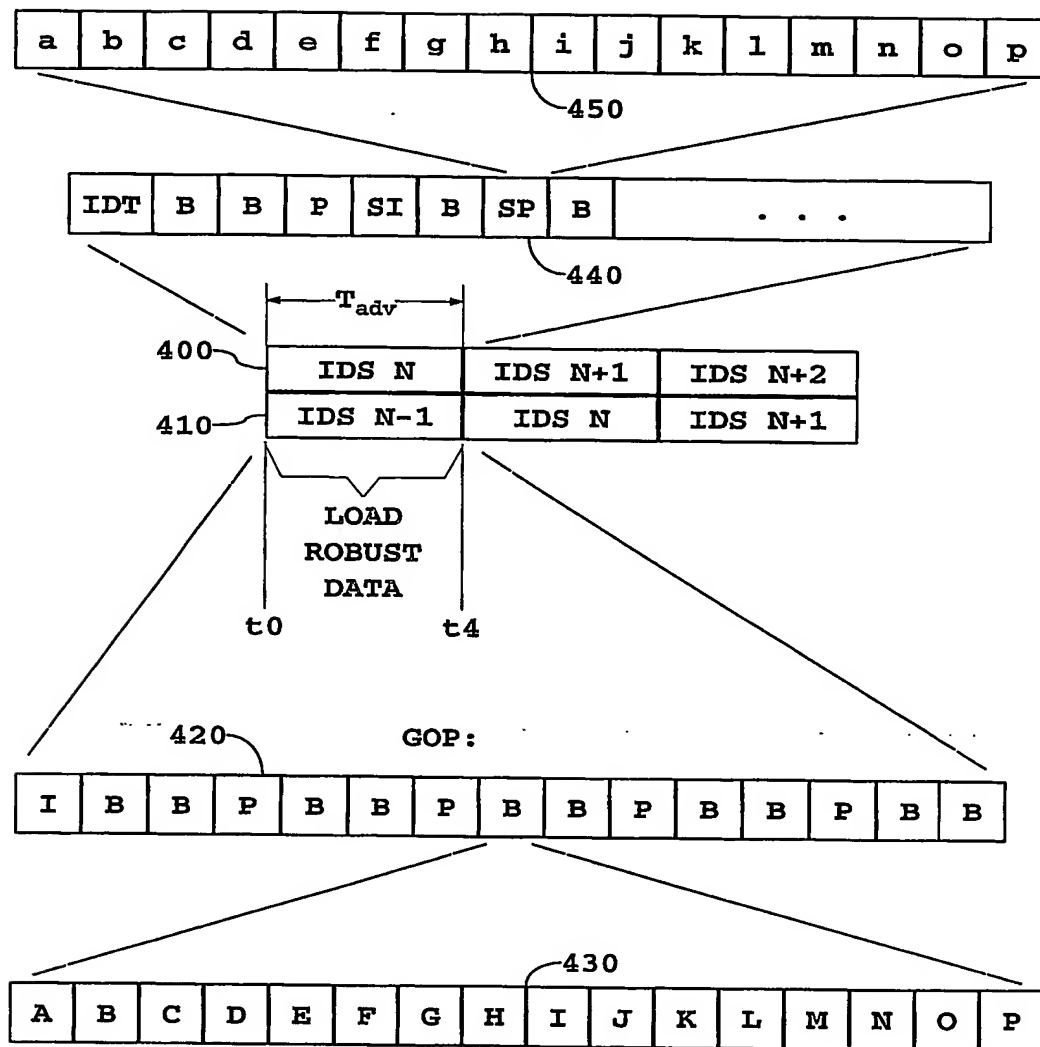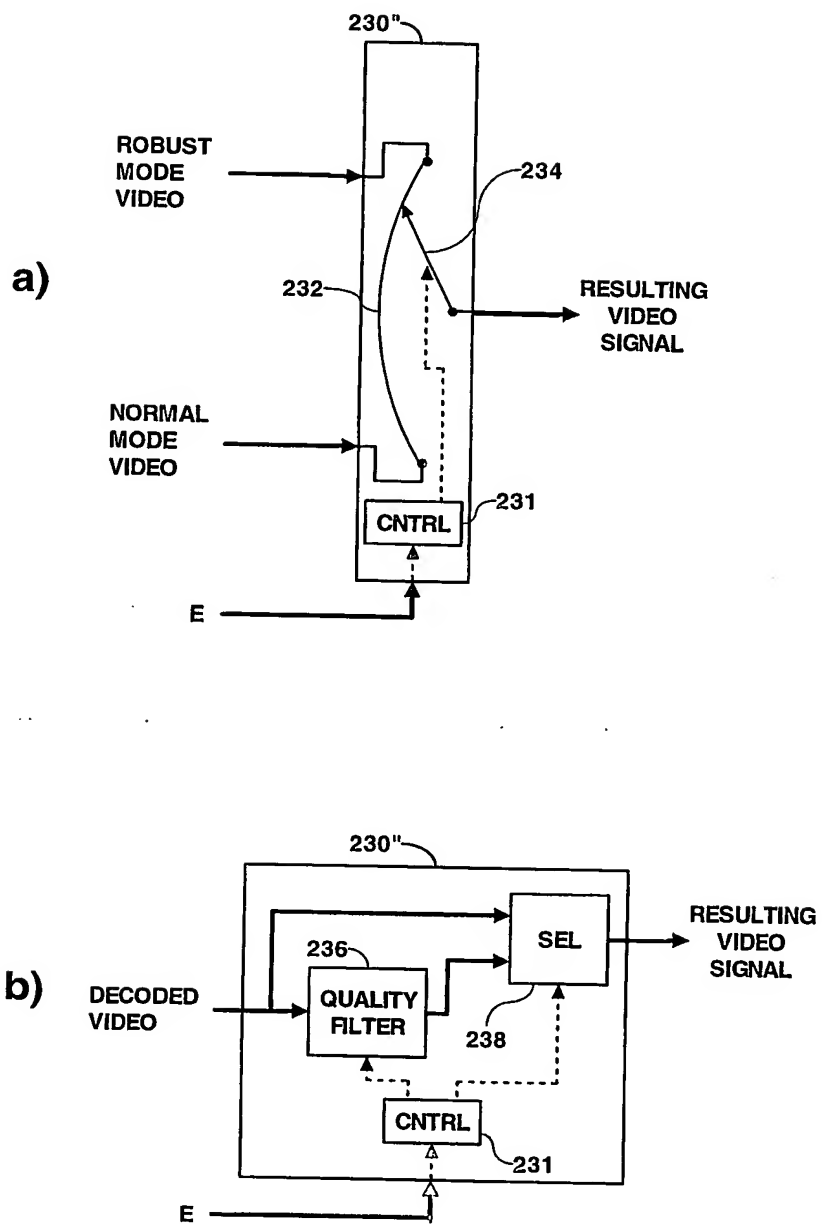
Fig. 5 Smoothing selector
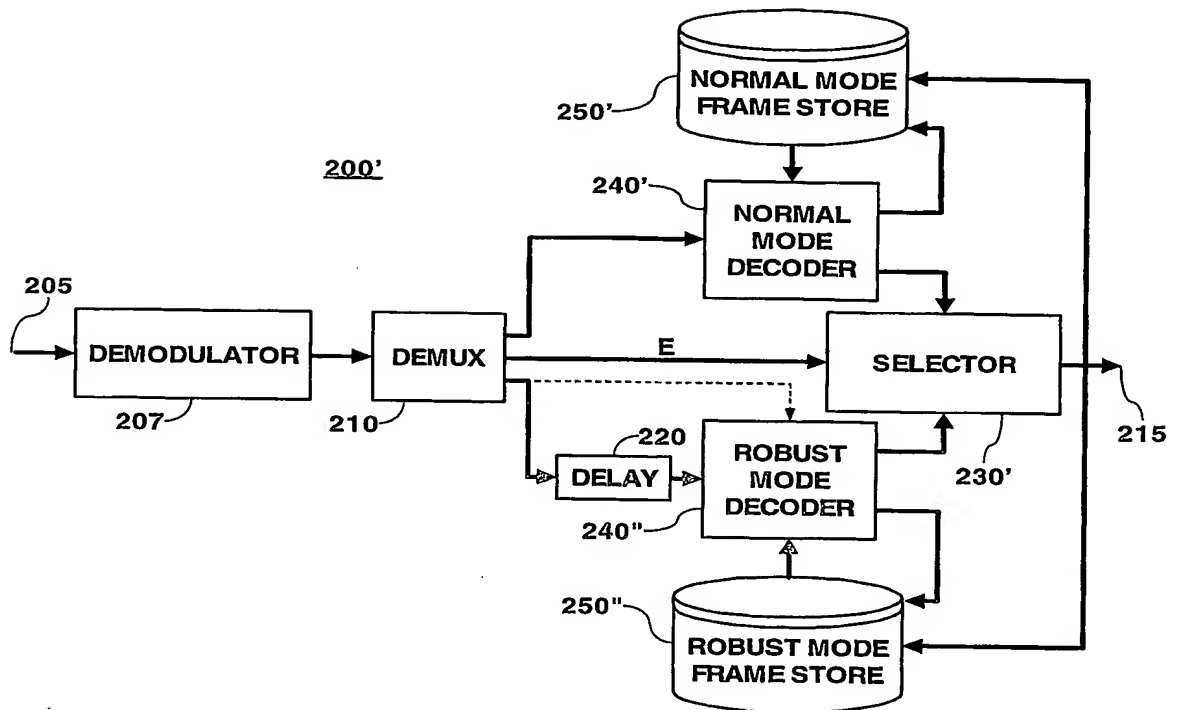
Fig. 6 Picture layer receiver

MPEG:

CODED	I	B	B	P	B	B	P	B	B	P	B	B	P	B	B	420
FRAMES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	520

SLICES

JVT:

CODED	IDR					...										440
FRAMES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	540

OUTPUT:

FRAMES	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	460
SOURCE	M	M	M	M	M	M	J	M	M	M	XX	M	M	J	M	560

Fig. 7 Picture layer streams

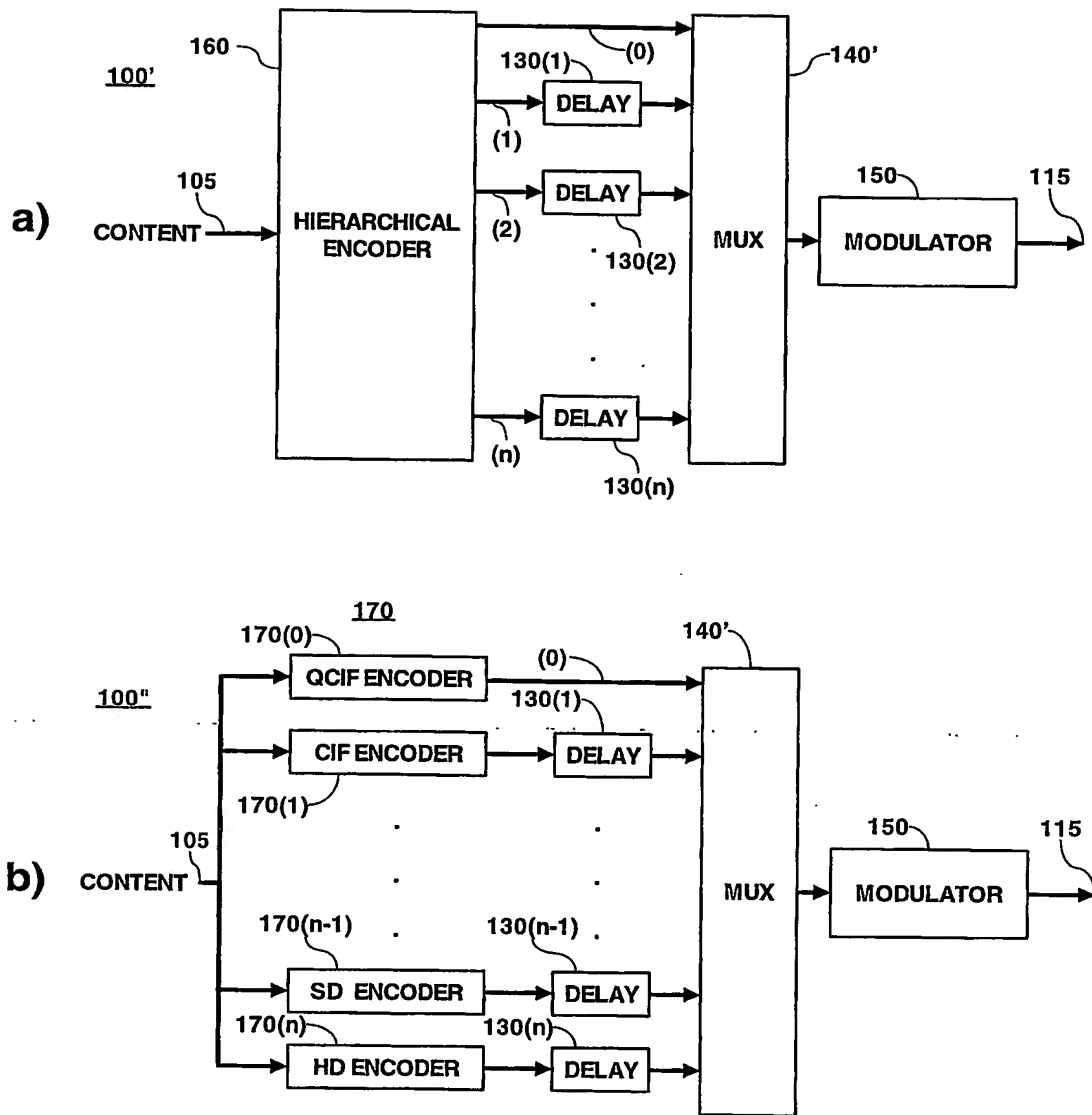| Number_of Robust_simulcast_channels	802	up to 256 channels supported	8 bit unit
For (i=0;I<number_of_robust_simulcast_channels;i++){			
Robust_Mode_PID	804	Identifies this channel in the TS	16 bit unit
Simulcast_data_type	806	0 = video 1 = audio 2 = data	2 bit unit
If(Simulcast_data_type_=_0){	812		
Robust_Mode_video_compression_format		0 = ATSC MPEG2 MP@HL 1 = JVT MP@level all others reserved_for_future_use	6 bit unit
Robust_Mode_video_frame_rate		Frame rate in frames per second	7 bit unit
Robust_Mode_video_frame_interlaced		If O then progressive, else interlaced	1 bit unit
Robust_Mode_video_frame_horz		Horizontal frame resolution	16 bit unit
Robust_Mode_video_frame_vert		Vertical frame resolution	16 bit unit
Robust_Mode_video_frame_bitrate		Video elementary stream bit rate in bps	32 bit unit
Else	814		
Robust_Mode_audio_compression_format		0 ATSC AC-3 1 MP3pro all others reserved	6 bit unit
Robust_Mode_audio_bitrate		Audio elementary bit rate in bps	24 bit unit
Robust_Mode_audio_sampie_rate		Audio sample rate in Ksamples per sec	8 bit unit
Robust_Mode_audio_mode		0 5.1 channels 1 2 channel others	8 bit unit
}			
Normal_mode_simulcast_PID	808	PID of the normal channel which this robust mode channel duplicates.	16 bit unit
Robust_to_Normal_delay_offset	810	A 32 bit value in 90 KHZ clock cycles indicating the delay from robust channel to the normal channel	32 bit unit
Robust_Mode_High_Quality	816	IF 0 THEN the receiver should use the normal channel if available ELSE the broadcaster recommends use of the robust channel instead of the normal channel	1 bit unit
} // end for loop robust channels			

Fig. 8 PSIP/VCT Table

a)

100' 160 HIERARCHICAL ENCODER

105 CONTENT

(0) — 130(1) DELAY — 140'

(1) — 130(2) DELAY

(2)

130(2)

(n) — 130(n) DELAY

MUX — 150 MODULATOR — 115

b)

170 170(0) QCIF ENCODER (0)

170(1) CIF ENCODER 130(1) DELAY

100"

105 CONTENT

170(n-1) SD ENCODER 130(n-1) DELAY
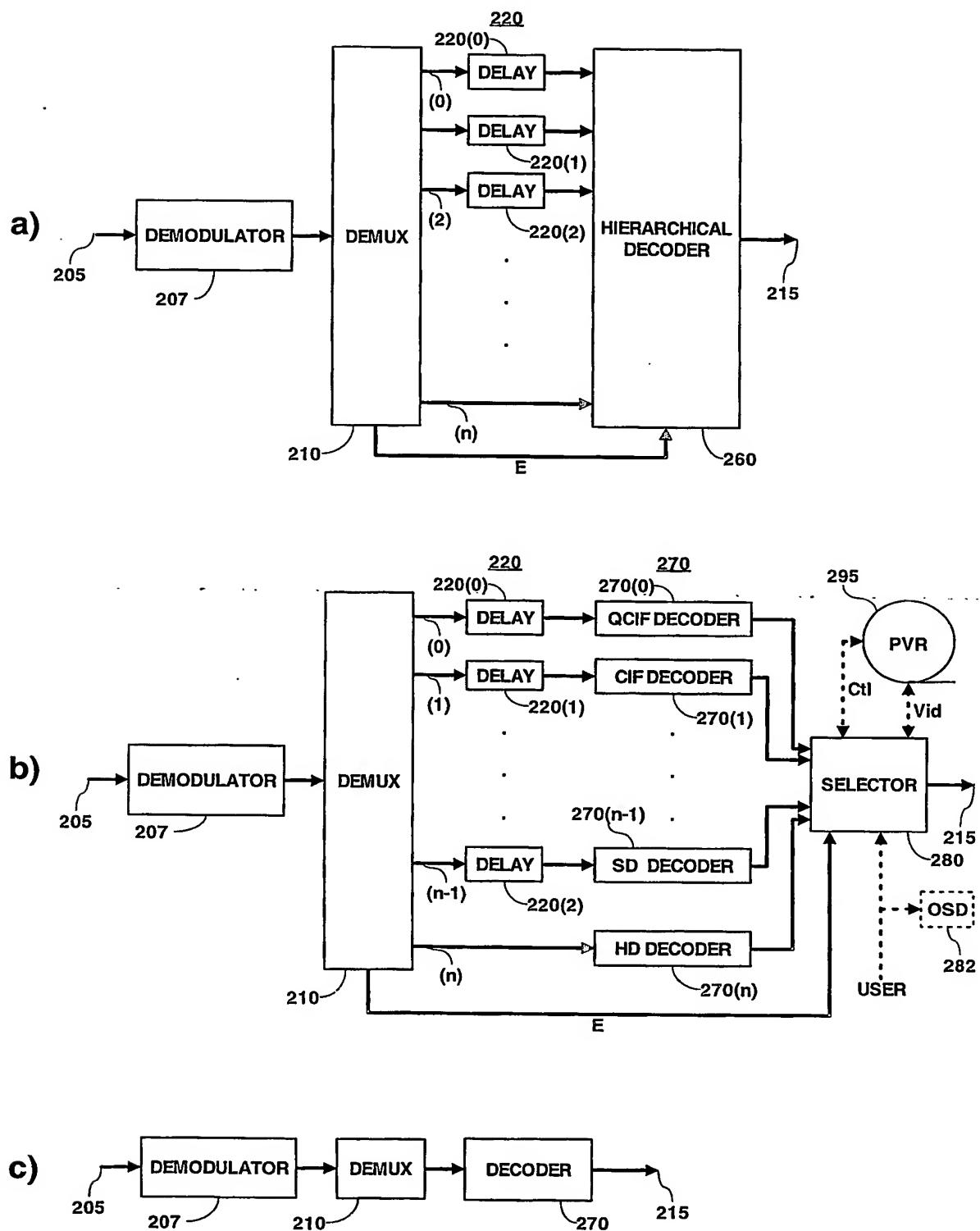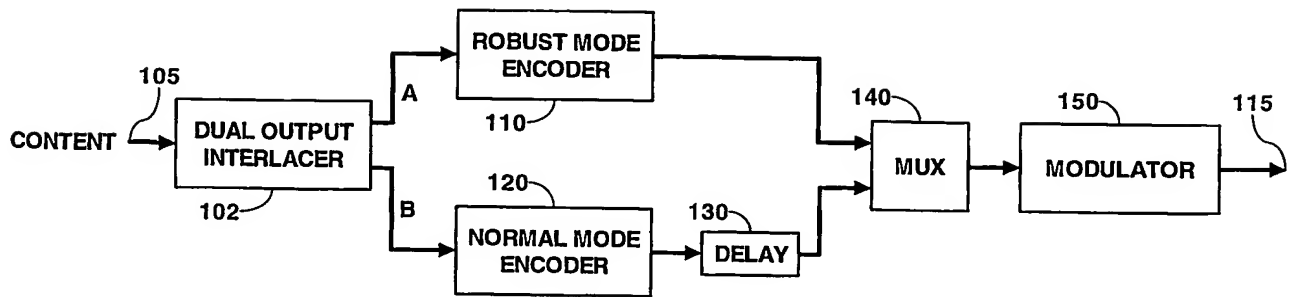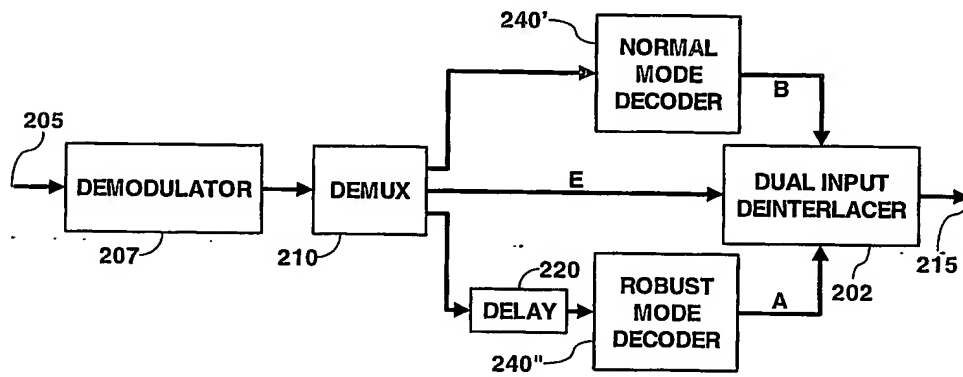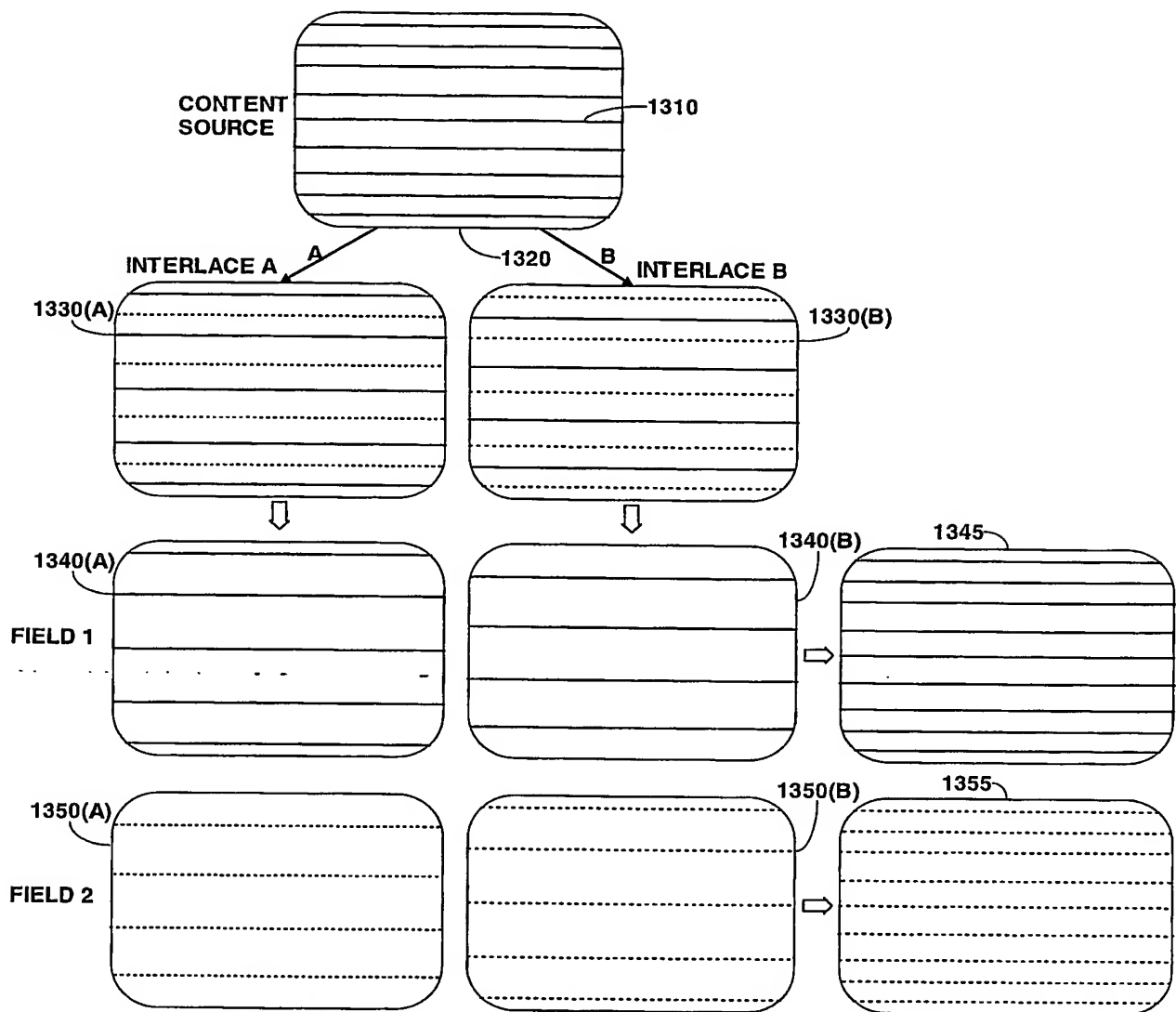
170(n) HD ENCODER 130(n) DELAY

140'

MUX — 150 MODULATOR — 115

Fig. 9 Multiresolution transmitter

Fig. 10 Multiresolution receiver

Fig. 11 Dual interlace transmitter

Fig. 12 Dual interlace receiver

Fig. 13 Dual interlace display images